# technical information

**MODELS**
**500**
**705,800**
**905,906**
**910,911**

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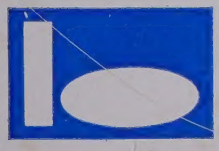

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C O N T E N T S


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BRANDENBURG LIMITED,
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SURREY. ENGLAND.

TELEPHONE NOS: 01-657 0225-7.

## THE DIFFERENT MODELS.

| MODEL | OUTPUT | POLARITY |
|---|---|---|
| 500 | 500 V to 5KV at 5 mA | REVERSIBLE |
| 705 | 1.5KV to 15KV at 2 mA | REVERSIBLE |
| 800 | 3 to 30KV at 1 mA | REVERSIBLE |
| 905 | 6 to 60KV at 400µA | POSITIVE |
| 906 | 6 to 60KV at 400µA | NEGATIVE |
| 910 | 10 to 100KV at 250µA | POSITIVE |
| 911 | 10 to 100KV at 250µA | NEGATIVE |

MODELS 500, 705 AND 800 differ from one another only in certain component values shown.

MODELS 905 AND 906 differ from one another in the polarity of output and certain component values given in Appendix.
They differ from Models 705 and 800 in their high voltage heads, which employ selenium pencil rectifiers in place of valve rectifiers, and they do not use the filament oscillator valve V2 and associated components used on models 705 and 800 to heat the filaments of the high voltage valve rectifiers. They also differ in certain component values as given in Appendix.

MODELS 910 AND 911 differ from one another only in the polarity of output and certain component values given in Appendix.
They differ from Models 905 and 906 in their high voltage heads and certain component values also given in Appendix.

## SPECIFICATIONS

* **INPUT:** 200/250 volts, 50/60 cycles 150 V.A. approx.

| MODEL | OUTPUT | POLARITY | RIPPLE |
|---|---|---|---|
| 500 | 500 V to 5KV at 5 mA. | REVERSIBLE | 0.1% p/p |
| 705 | 1.5KV to 15KV at 2 mA. | REVERSIBLE | 0.1% p/p |
| 800 | 3 to 30KV at 1 mA. | REVERSIBLE | 0.1% p/p |
| 905 | 6 to 60KV at 400µA | POSITIVE | 100V p/p |
| 906 | 6 to 60KV at 400µA | NEGATIVE | 100V p/p |
| 910 | 10 to 100KV at 250µA | POSITIVE | 0.3% p/p |
| 911 | 10 to 100KV at 250µA | NEGATIVE | 0.3% p/p |

**REGULATION:** Better than 0.25% at full voltage from zero to full load.

**STABILITY AGAINST + 10% MAINS - 7% MAINS:** Typically 0.1%. (Models 910/911 0.25%)

**PROTECTION:** Mains and H.T. fuses and electromagnetic overload cut-out.

**OUTPUT VOLTAGE INDICATION:** $3\frac{3}{4}$ in. scale meter. 2% accuracy.

**OUTPUT CURRENT INDICATION:** Current metering jack located on rear panel.

**POWER OSCILLATOR FREQUENCY:** 12 - 15 Kcs. all models.

**OUTPUT PLUG & SOCKET:**

MODELS 500, 705 AND 800.

BRANDENBURG design, moulded in polythene, cable length 2 metres, unless otherwise requested.
(SPARES:- Plug type 800/16A.
Socket type 800/17A).

MODELS 905, 906, 910 AND 911.

BRANDENBURG design, nickel plated on brass fitted with 2 metres of screened cable.

**INPUT CONNECTION:** 2 metres of 3 core input cable is standard on all models.

* Supplied with 100/125 volts input if so ordered.

## OPERATING INSTRUCTIONS

### PRELIMINARY PRECAUTIONS.

When unpacking, take off top cover by removing fixing screws and examine the interior. Check as follows:-

(a) That all valves are firmly seated.

(b) That both plug-in relays are in-situ.

(c) That the polythene high voltage plugs to the high voltage capacitors and to the polarity change device and E.H.T. transformer are all firmly seated.

1. Ensure that the mains adjust panel, located on the top, is set to agree with your mains supply.

2. Connect a suitable 3 pin plug to the mains cable, located at the rear, making quite certain that polarity is strictly observed.

| | | |
|---|---|---|
| RED | = | LINE |
| BLACK | = | NEUTRAL |
| GREEN | = | EARTH |

3. EARTHING.

Two earth terminals are provided at the rear of the unit. That earth terminal located next to the E.H.T. output socket is for the low potential return of the external load. The other earth terminal is provided to connect the supply securely to earth. Failure to do this could result in charges being built up on the case.

4. Switch on the mains. With E.H.T. control at minimum, an interval of one minute must be allowed to reach operating conditions before switching on the E.H.T.

5. Switch on the E.H.T. Two controls situated on the front panel are for coarse and fine adjustment and both are continuously variable.
Set the "fine" control in the centre of its traverse and then set the voltage required by means of the coarse control. Fine adjustment can then be carried out by means of the fine control.

6. CURRENT METERING JACK.

The current metering jack and socket have been inserted between the 0 volts line and frame, see circuit diagram.
When the unit is despatched the current metering jack is fitted with a shorting link. This shorting link must remain except when a meter is connected for measuring purposes.

NOTE: In the event of the unit being stored or left under damp conditions, it is advisable to switch on the mains only and allow the unit to warm up before switching on the E.H.T. 20 to 30 minutes should be ample.

## SUMMARY OF OPERATION

## (BASED ON MODEL 800)

Two power valve oscillators V8 and V9 operating at high frequency have, as their anode load transformer T2, the output of which is fed to a conventional high voltage doubler which comprises C20, V12, V13 and C23.

The maximum voltage across the secondary of T2 is approximately 15 K.V. R.M.S. A sample of the output voltage is taken from the junction of R45 and R42 and fed via R41 to the comparator amplifier V10 and V11. The output of this comparator amplifier is fed, via R24, to the grid of cathode follower V7, the cathode of which is connected to the screens of the two power valve oscillators via S2B, RLC/1, RLA/2, S4, R28 and R27.

The comparator amplifier has as its reference 2 glow discharge tubes connected in series, V5 and V6, the centre point of which is connected via R29 to the grid of V10. Any change in output voltage is, therefore, sensed by V11 and compared with the reference voltage at the grid of V10, an amplified version of which will appear at the anodes of V10 and V11. This amplified voltage is passed to the grid of V7 and its sense is such as to oppose any change in output voltage.

The necessary D.C. Supply voltage required for valves V7, V8 and V9 is obtained from the cathode of rectifier valve V1 and smoothing is achieved by C4 and C5 in series.

A separate heater supply, isolated to 30 K.V. is required to heat valves V12 and V13 and for this purpose a separate filament oscillator is used. This colpitts oscillator, V2, obtains its D.C. supply from the 275 volt tapping on transformer T1 and rectification and smoothing is provided by diode D2 and capacitor C1. The R.F. Choke RFC H.1 provided in this line is inserted to provide high impedance between the oscillator circuit and power supply. RV2 is used to make a final adjustment in production to ensure that the heaters of V12 and V13 are running at the correct temperature. The D.C. supply from D2 is also used to provide the necessary screen voltage for valve V7.

The frequency of the filament oscillator is approximately 2.5 megocycles. Valves V3 and V4 are glow discharge tubes and are inserted to provide a regulated supply to the anodes of the comparator amplifier. This is necessary in order to achieve the stability claimed for this supply.

Reference valves V5 and V6 obtain their supply from the same 275 volt tapping on transformer T1, but in this case rectification is provided by diode D1 and smoothing by the network C2, C3 and R5. This line is Negative with respect to ground.

Polarity reversal is achieved simply by connecting the cathode of V13 to ground and taking the output from the anode of V12 or vice-versa.

When the polarity of output is changed it is necessary to change the sense of the amplifier. This is achieved by Relay RLB4 which is energised or not according to the position of S3 which is a micro-switch actuated by the position of the polarity change plug. When the supply is connected to "Positive Polarity" switch S3 is open and vice-versa.

Thus, operation of RLB4 changes over relay contacts B1, B2, B3 and B4 effectively changing:-

1. Polarity indication lights.
2. Reference voltage.
3. Amplifier phase.
4. Meter polarity.

The volt-meter (100μA full scale deflection) is in series with R47 and R43. R47 is made up of 59 X 5 megohm resistors in series and this, together with R43 makes a total of 300 megohms. Thus, the meter will read F.S.D. when its output is adjusted to 30 K.V. Since the resistor tolerance of R47 is minus 2% R43 is used to pad such that the accuracy of the voltage reading is plus/minus 2% at F.S.D. Due to the good voltage co-efficient of the high stability resistors used, the 1/2 scale accuracy is also plus/minus 2%.

NOTE: The above description holds good for all models except that models 705 and 800 use high voltage valve rectifiers and models 905, 906, 910, 911 and 500 use solid state rectifiers and, of course, in this case the filament oscillator is not necessary. The value of R47 changes from model to model. Only models 500, 705 and 800 have reversible polarity facilities.

## FUNCTION OF RELAYS (BASED ON MODEL 800)

RLA 2 OVERCURRENT RELAY. Relies on the total current drawn by power valves V8 and V9 for its operation and is intended for the protection of the supply itself and pulls in at 130 mA approx. However, part of this current is diverted through R9 in shunt with R11 and RV1. An overload, that is, more than 1 mA at 30 K.V., energises the relay which opens A2 and changes over A1. A1 acts as a "hold" contact and A2 removes drive from V8 and V9.

RLB 4 POLARITY CHANGE RELAY Operation is by means of S3 which in turn is a function of the polarity change plug fitted at the rear of the supply. When the unit is connected to Positive "polarity" S3 is open and B1, 2, 3 and 4 are as shown. When connected to "Negative" polarity contacts B1, 2, 3 and 4 change over.

RLC 1 PROTECTION RELAY. (REED TYPE) The above shows that when the supply is operated in the "Negative Mode" RLB4 is energised. Should the mains fail RLB4 will be de-energised and the phase of the comparator amplifier will be reversed and would drive hard with a consequent high rise in output voltage for a short period. This relay is inserted to avoid this - should the mains fail RLC1 will de-energise opening contact C1 thereby removing the E.H.T.

## THE SWITCHES

S1. Double pole Mains on/off switch.

S2. E.H.T. switch S2a and S2b.

S3. A microswitch built into the reversing plug which operates when supply is set for negative polarity. In turn, S3 actuates RLB4.

S4. A microswitch built into the reversing plug removes the E.H.T. should the operator attempt to change the polarity of output whilst the E.H.T. is switched on.

NOTE: S3 and S4 are NOT FITTED ON MODELS 905, 906, 910 and 911. S4 is bridged on all four models and S3 bridged on Models 906 and 911. This modification is achieved by PL3. Pins 4, 5, 6 and 7 refer.

## VARIABLE RESISTORS

RV1. Trip sensitivity. This is adjusted at the Works to trip at the full output voltage and at a current in excess of the specified value. When, for example, the unit is adjusted to 30 K.V. and is passing 1 mA, the anode current, which passes through RLA and its parallel components is approximately 115 mA. The relay is adjusted, by means of RV1, to trip at a current of a little in excess of this.

RV2. Sets filament temperature of V12 and V13. Once set this never needs adjustment.

RV3. Coarse Output Control. Varies reference bias to V11 grid.

RV4. Fine Output Control. Varies feed-back chain ratio.

RV5. Trims R42 for correct maximum output voltage.

# MECHANICAL NOTES

## MODEL 500.

The E.H.T. rectifiers used on Models 705/800 are not used in the above model. A rectifier assembly type 500/13/B (1) Fig. 3, plugs straight into the polarity reversing assembly (2). The rectifier is a potted assembly and cannot be serviced.

Order as: Rectifier Assembly Type 500/13/B.

## MODELS 705 AND 800.

The high voltage head comprises the E.H.T. transformer T2, the coupling capacitor C20, the two high voltage rectifier valves V12 and V13 smoothing capacitors C23 and C24 and smoothing resistor R46 and feed-back resistor R47. All these components are easily removed for replacement.

### REPLACING T2.

1. Unplug item (1) Fig. 1 from C20.
2. Remove the four 4BA screws, items 2 which hold the transformer base-plate, item 3, to the centre dividing plate, item 4.
3. Unsolder from the rear the leads that go to the lead-through terminals, as follows:-

| | | | |
|---|---|---|---|
| BLUE | LEAD | FROM | CB3. |
| RED | " | " | CB4. |
| GREEN | " | " | CB1. |
| GREY | " | " | CB2. |

Reverse the procedure to re-assemble.

**NOTE:**

Replacement transformers are supplied as a complete assembly. When ordering a replacement, order as follows:-

Transformer No./Model No./Serial No.
e.g. 1 off T2 Model 800 /Serial No. XYZ.

### REPLACING R46.

Refer to Fig. 1 and unplug item 5 and item 7 from item 8. Now gently ease off item 8 from R47, C23 and C24. Unscrew the two brass sockets from the tops of C23 and C24. R46 can now be removed.

### REPLACING C23, C24 AND R47.

Carry out instructions for replacing R46 and these two capacitors can be easily removed by unscrewing the nut holding each to the plastic baseplate, item 9. R47 can be removed by similarly undoing the two 4BA fixing screws.

### REPLACING C20.

Unplug item 1, Fig. 1 from C20. This component can now be unscrewed from the secondary of T1 and removed.

* E.H.T. OUTPUT CABLE REPLACEMENT.

The output cable is connected via a 2BA solder nipple screwed into the moulded plug.

TO REMOVE CABLE.

Withdraw plug from unit, grip the soldered nipple and turn plug clockwise (viewed from nipple end) until thread is clear. Withdraw the wire through plug and unsolder nipple.

Solder new lead to nipple ensuring that nipple threads are clear of solder. Replace lead by reversing above procedure.

REPLACEMENT PARTS, if required:-

E.H.T. Output Plug Type 800/16/A.

Plug Nipple Type 3544/15/A.

* E.H.T. cable is Type 11 obtainable from BRANDENBURG LIMITED,
139, SANDERSTEAD ROAD,
SOUTH CROYDON, SURREY.

## MECHANICAL NOTES.

## MODELS 905 AND 906 ONLY.

### REPLACING T2.

1. Unplug Fig. 2 from C20.
2. Remove the four 4BA nuts and screws (Item 2, Fig. 2) from the two side plates which form the housing of T2 (Item 3).
3. Unsolder leads from the side plate as follows:-

| | | | |
|---|---|---|---|
| BLUE | LEAD | FROM | CB1. |
| RED | " | " | CB2. |
| GREEN | " | " | CB3. |
| GREY | " | " | CB4. |

Reverse the procedure to re-assemble.

NOTE: Replacement transformers are supplied as a complete item.

Order as follows:-

T2, Model No. / Serial No.....

The high voltage head in Models 905 and 906 is, with the exception of T2 and C20, contained in a perspex box. Should a fault develop in this box it must be returned to BRANDENBURG where it will receive immediate attention.

### REPLACING R50.

1. Remove high voltage output plug.
2. Remove the clamping plate immediately above high voltage head by removing the 4 retaining screws. (2) Fig. 2.
3. Unplug PLSK3 (black octal plug and socket assembly). (3) Fig. 2.
4. Unplug C20 from head. (4) Fig. 2.
   NOTE: Models 905/906. After operation 4, before proceeding to step 5, it is necessary to slacken the 2 screws on bracket at bottom of head.
5. With great care lift out the high voltage head.
6. Pull out R50 assembly (clearly marked).
7. Unscrew metal coaxial plug and R50 can be easily replaced.
8. To reassemble, reverse procedure.

### FITTING THE OUTPUT PLUG TO THE OUTPUT SOCKET.

An output plug is provided fitted with a cable 2 metres in length unless otherwise specified.

Very carefully feed the output plug into the output socket which is situated at the rear of the supply.

The plug is held in position by the circular plate which is screwed to the output socket flange. The four screws are supplied with each instrument and will be found in-situ.

When screwing on the plate be sure to tighten each screw a little in turn in order that the plate fits evenly and takes up its natural position.

## MODELS 910 AND 911

These models vary mechanically a little from Models 905 and 906 but the above instructions apply.

OUTPUT CABLE.

905/906 - Sterling Cables - Type SC310.
910/911 - " " - Type Uniradio 74.

## ELECTRICAL INFORMATION

| RESISTORS | MODELS | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | 500 | 705 | 800 | 905 | 906 | 910 | 911 | |
| R1 | 100Ω | 100Ω | 100Ω | 100Ω | 100Ω | 100Ω | 100Ω | 6 watt w.w. |
| R2 | 100Ω | 100Ω | 100Ω | 100Ω | 100Ω | 100Ω | 100Ω | 6 watt w.w. |
| R3 | 470K | 470K | 470K | 470K | 470K | 470K | 470K | ½ watt c. |
| R4 | 470K | 470K | 470K | 470K | 470K | 470K | 470K | ½ watt c |
| R5 | 10K | 10K | 10K | 10K | 10K | 10K | 10K | 3 watt w.w. |
| R6 | 47Ω | 47Ω | 47Ω | 47Ω | 47Ω | 47Ω | 47Ω | ½ watt c. |
| R7 | 10Ω | 10Ω | 10Ω | 10Ω | 10Ω | 10Ω | 10Ω | ½ watt c. |
| R8 | 47Ω | 47Ω | 47Ω | 47Ω | 47Ω | 47Ω | 47Ω | 1.5 watt w.w. |
| R9 | 47Ω | 47Ω | 47Ω | 47Ω | 47Ω | 47Ω | 47Ω | 1.5 watt w.w. |
| R10 | 470K | 470K | 470K | 470K | 470K | 470K | 470K | ¼ watt c. |
| R11 | 10Ω | 10Ω | 10Ω | 10Ω | 10Ω | 10Ω | 10Ω | 3 watt w.w. |
| R12 | - | 10K | 10K | - | - | - | - | 3 watt w.w. |
| R13 | - | 100K | 100K | - | - | - | - | ½ watt c. |
| R14 | - | 33K | 33K | - | - | - | - | ½ watt c. |
| R15 | 330K | 330K | 330K | 330K | 330K | 330K | 330K | ¼ watt c. |
| R16 | 1 meg. | 1 meg. | 1 meg. | 1 meg. | 1 meg. | 1 meg. | 1 meg. | ½ watt c. |
| R17 | 470K | 470K | 470K | 470K | 470K | 470K | 470K | ½ watt c. |
| R18 | 10K | 10K | 10K | 10K | 10K | 10K | 10K | 3 watt w.w. |
| R19 | 56K | 56K | 56K | 56K | 56K | 56K | 56K | ½ watt c. |
| R20 | 270K | 270K | 270K | 270K | 270K | 270K | 270K | ¼ watt c. |
| R21 | 270K | 270K | 270K | 270K | 270K | 270K | 270K | ¼ watt c. |
| R22 | 20K | 20K | 20K | 20K | 20K | 20K | 20K | 6 watt w.w. |
| R23 | 470K | 470K | 470K | 470K | 470K | 470K | 470K | ½ watt c. |
| R24 | 10K | 10K | 10K | 10K | 10K | 10K | 10K | ½ watt c. |
| R25 | 5K | 25K | 25K | 25K | 25K | 25K | 25K | ½ watt H.S. |
| R26 | 8.2K | 5.6K | 5.6K | 5.6K | 5.6K | 560Ω | 560Ω | ½ watt H.S. |
| R27 | 100Ω | 100Ω | 100Ω | 100Ω | 100Ω | 100Ω | 100Ω | ½ watt c. |
| R28 | 33Ω | 33Ω | 33Ω | 33Ω | 33Ω | 33Ω | 33Ω | ¼ watt c. |

## ELECTRICAL INFORMATION (CONT'D)

### RESISTORS.

| | MODELS | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | 500 | 705 | 800 | 905 | 906 | 910 | 911 | |
| R29 | 100K | 100K | 100K | 100K | 100K | 100K | 100K | ¼ watt c. |
| R30 | 2 Meg. | 2 Meg. | 2 Meg. | 2 Meg. | 2 Meg. | 2 Meg. | 2 Meg. | ½ watt H.S. |
| R31 | 10Ω | 10Ω | 10Ω | 10Ω | 10Ω | 10Ω | 10Ω | ½ watt c. |
| R32 | 100Ω | 100Ω | 100Ω | 100Ω | 100Ω | 100Ω | 100Ω | ½ watt c. |
| R33 | 390K | 390K | 390K | 390K | 390K | 390K | 390K | ½ watt H.S. |
| R34 | 10Ω | 10Ω | 10Ω | 10Ω | 10Ω | 10Ω | 10Ω | ½ watt c. |
| R35 | 100Ω | 100Ω | 100Ω | 100Ω | 100Ω | 100Ω | 100Ω | ½ watt c. |
| R36 | 2 Meg. | 2 Meg. | 2 Meg. | 2 Meg. | 2 Meg. | 2 Meg. | 2 Meg. | ½ watt H.S. |
| R37 | 100Ω | 100Ω | 100Ω | 100Ω | 100Ω | 100Ω | 100Ω | ½ watt c. |
| R38 | 3.9K | 6.8K | 6.8K | 5.6K | 5.6K | 12K | 12K | ½ watt c. |
| R39 | 4.7K | 3.9K | 3.9K | 2.7K | 2.7K | 12K | 12K | ½ watt c. |
| R40 | 1 Meg. | 1 Meg. | 1 Meg. | 1 Meg. | 1 Meg. | 1 Meg. | 1 Meg. | ¼ watt c. |
| R41 | 100K | 100K | 100K | 100K | 100K | 100K | 100K | ¼ watt c. |
| R42 | 1 Meg. | 1 Meg. | 1 Meg. | 1 Meg. | 1 Meg. | 2 Meg. | 2 Meg. | ½ watt H.S. |
| * R43 | 0-5 Meg. | 0-5 Meg. | 0-5 Meg. | 0-5 Meg. | 0-5 Meg. | 0-5 Meg. | 0-5 Meg. | ½ watt H.S. |
| R44 | 1 Meg. | 1 Meg. | 1 Meg. | 1 Meg. | 1 Meg. | 1 Meg. | 1 Meg. | ½ watt H.S. |
| R45 | 1 Meg. | 1 Meg. | 1 Meg. | 1 Meg. | 1 Meg. | 1 Meg. | 1 Meg. | ½ watt H.S. |
| R46 | 50K | 100K | 330K | - | - | - | - | 2 watt c. |
| R47 | 50 Meg. | 150 Meg. | 300 Meg. | 600 Meg. | 600 Meg. | 2000 Meg. | 2000 Meg. | |
| R48 | 330K | 330K | 330K | 330K | 330K | 330K | 330K | ¼ watt c. |
| R49 | 1 Meg. | - | - | 1 Meg. | 1 Meg. | 1 Meg. | 1 Meg. | ½ watt c. |
| R50 | - | - | - | 470K | 470K | 470K | 470K | 2 watt c. |
| R51 | 5Ω | 5Ω | 5Ω | 5Ω | 5Ω | 5Ω | 5Ω | 3 watt w.w. |
| R52 | 50 Meg. | - | - | - | - | - | - | |
| R53 | 5K | - | - | - | - | - | - | 20 watt w.w. |
| R54 | - | - | - | - | - | 2.7K | 2.7K | ½ watt H.S. |

### VARIABLE RESISTORS.

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| RV1 | 10Ω | 10Ω | 10Ω | 10Ω | 10Ω | 10Ω | 10Ω | 1 watt. |
| RV2 | - | 5K | 5K | - | - | - | - | 1 watt. |
| RV3 | 100K | 100K | 100K | 100K | 100K | 100K | 100K | 3 watt. |
| RV4 | 50K | 50K | 50K | 50K | 50K | 50K | 50K | 3 watt. |
| RV5 | 50K | 50K | 50K | 50K | 50K | 50K | 50K | 1 watt. |

* Meter calibration resistor.

## ELECTRICAL INFORMATION (CONT'D)

### CAPACITORS.

| | 500 | 705 | 800 | 905 | 906 | 910 | 911 | |
|---|---|---|---|---|---|---|---|---|
| C1 | 16 µF | 16 µF | 16 µF | 16 µF | 16 µF | 16 µF | 16 µF | Electrolytic 500V |
| C2 | 16 µF | 16 µF | 16 µF | 16 µF | 16 µF | 16 µF | 16 µF | Electrolytic 500V |
| C3 | 16 µF | 16 µF | 16 µF | 16 µF | 16 µF | 16 µF | 16 µF | Electrolytic 500V |
| C4 | 100 µF | 100 µF | 100 µF | 100 µF | 100 µF | 100 µF | 100 µF | Electrolytic 450V |
| C5 | 100 µF | 100 µF | 100 µF | 100 µF | 100 µF | 100 µF | 100 µF | Electrolytic 450V |
| C6 | 500 µF | 500 µF | 500 µF | 500 µF | 500 µF | 500 µF | 500 µF | Electrolytic 12V |
| C7 | 500 µF | 500 µF | 500 µF | 500 µF | 500 µF | 500 µF | 500 µF | Electrolytic 12V |
| C8 | - | 1000pF | 1000pF | - | - | - | - | Mica 350V |
| C9 | - | 330pF | 330pF | - | - | - | - | Mica 750V |
| C10 | - | 1000pF | 1000pF | - | - | - | - | Mica 750V |
| C11 | - | 100pF | 100pF | - | - | - | - | Mica 350V |
| C12 | 0.022 µF | 0.022 µF | 0.022 µF | 0.022 µF | 0.022 µF | 0.022 µF | 0.022 µF | Paper 600V |
| C13 | 0.022 µF | 0.022 µF | 0.022 µF | 0.022 µF | 0.022 µF | 0.022 µF | 0.022 µF | Paper 600V |
| C14 | 0.25 µF | 0.25 µF | 0.25 µF | 0.25 µF | 0.25 µF | 0.25 µF | 0.25 µF | Paper 250V |
| C15 | 0.005 µF 350V | 0.022 µF 600V | 0.022 µF 600V | 0.022 µF 600V | 0.022 µF 600V | 0.022 µF 600V | 0.022 µF 600V | Paper |
| C16 | 0.022 µF | 0.022 µF | 0.022 µF | 0.022 µF | 0.022 µF | 0.022 µF | 0.022 µF | Paper 1000V |
| C17 | - | - | - | - | - | - | - | |
| C18 | 1000pF | 1000pF | 1000pF | 1000pF | 1000pF | 1000pF | 1000pF | Mica 350V |
| C19 | - | - | - | - | - | - | - | |
| C20 | 1200 pF 20KV | 500pF 20KV | 500pF 20KV | 1000pF 15KV | 1000pF 15KV | 1200pF 20KV | 1200pF 20KV | Ceramic |
| C21 | 0.01 µF 1000V | 0.022 µF 600V | 0.022 µF 600V | 0.022 µF 600V | 0.022 µF 600V | 0.022 µF 600V | 0.022 µF 600V | Paper |
| C22 | 0.005 µF 350V | 0.005 µF 350V | 0.005 µF 350V | 0.01 µF 600V | 0.01 µF 600V | 0.02 µF 600V | 0.02 µF 600V | Mica |
| C23 | 0.01 µF 6KV | 2000pF 20KV | 1000pF 30KV | - | - | - | - | Paper |
| C24 | 0.01 µF 6KV | 2000pF 20KV | 1000pF 30KV | - | - | - | - | Paper |
| C25 | 0.5 µF 400V | 0.22 µF 250V | 0.22 µF 250V | 0.022 µF 1000V | 0.25 µF 350V | 0.47 µF 400V | 0.47 µF 400V | Paper |

## ELECTRICAL INFORMATION (CONT'D)

### CAPACITORS.

| | 500 | 705 | 800 | 905 | 906 | 910 | 911 | |
|---|---|---|---|---|---|---|---|---|
| C1 | 16 µF | 16 µF | 16 µF | 16 µF | 16 µF | 16 µF | 16 µF | Electrolytic 500V |
| C2 | 16 µF | 16 µF | 16 µF | 16 µF | 16 µF | 16 µF | 16 µF | Electrolytic 500V |
| C3 | 16 µF | 16 µF | 16 µF | 16 µF | 16 µF | 16 µF | 16 µF | Electrolytic 500V |
| C4 | 100 µF | 100 µF | 100 µF | 100 µF | 100 µF | 100 µF | 100 µF | Electrolytic 450V |
| C5 | 100 µF | 100 µF | 100 µF | 100 µF | 100 µF | 100 µF | 100 µF | Electrolytic 450V |
| C6 | 500 µF | 500 µF | 500 µF | 500 µF | 500 µF | 500 µF | 500 µF | Electrolytic 12V |
| C7 | 500 µF | 500 µF | 500 µF | 500 µF | 500 µF | 500 µF | 500 µF | Electrolytic 12V |
| C8 | - | 1000pF | 1000pF | - | - | - | - | Mica 350V |
| C9 | - | 330pF | 330pF | - | - | - | - | Mica 750V |
| C10 | - | 1000pF | 1000pF | - | - | - | - | Mica 750V |
| C11 | - | 100pF | 100pF | - | - | - | - | Mica 350V |
| C12 | 0.022 µF | 0.022 µF | 0.022 µF | 0.022 µF | 0.022 µF | 0.022 µF | 0.022 µF | Paper 600V |
| C13 | 0.022 µF | 0.022 µF | 0.022 µF | 0.022 µF | 0.022 µF | 0.022 µF | 0.022 µF | Paper 600V |
| C14 | 0.25 µF | 0.25 µF | 0.25 µF | 0.25 µF | 0.25 µF | 0.25 µF | 0.25 µF | Paper 250V |
| C15 | 0.005 µF 350V | 0.022 µF 600V | 0.022 µF 600V | 0.022 µF 600V | 0.022 µF 600V | 0.022 µF 600V | 0.022 µF 600V | Paper |
| C16 | 0.022 µF | 0.022 µF | 0.022 µF | 0.022 µF | 0.022 µF | 0.022 µF | 0.022 µF | Paper 1000V |
| C17 | - | - | - | - | - | - | - | |
| C18 | 1000pF | 1000pF | 1000pF | 1000pF | 1000pF | 1000pF | 1000pF | Mica 350V |
| C19 | - | - | - | - | - | - | - | |
| C20 | 1200 pF 20KV | 500pF 20KV | 500pF 20KV | 1000pF 15KV | 1000pF 15KV | 1200pF 20KV | 1200pF 20KV | Ceramic |
| C21 | 0.01 µF 1000V | 0.022 µF 600V | 0.022 µF 600V | 0.022 µF 600V | 0.022 µF 600V | 0.022 µF 600V | 0.022 µF 600V | Paper |
| C22 | 0.005 µF 350V | 0.005 µF 350V | 0.005 µF 350V | 0.01 µF 600V | 0.01 µF 600V | 0.02 µF 600V | 0.02 µF 600V | Mica |
| C23 | 0.01 µF 6KV | 2000pF 20KV | 1000pF 30KV | - | - | - | - | Paper |
| C24 | 0.01 µF 6KV | 2000pF 20KV | 1000pF 30KV | - | - | - | - | Paper |
| C25 | 0.5 µF 400V | 0.22 µF 250V | 0.22 µF 250V | 0.022 µF 1000V | 0.25 µF 350V | 0.47 µF 400V | 0.47 µF 400V | Paper |

## ELECTRICAL INFORMATION (CONT'D)

### CAPACITORS.

| | MODELS | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | 500 | 705 | 800 | 905 | 906 | 910 | 911 | |
| C26 | 1 µF | 1 µF | 1 µF | 1 µF | 1 µF | 1 µF | 1 µF | Paper 160V |
| C27 | 1 µF | 1 µF | 1 µF | 1 µF | 1 µF | 1 µF | 1 µF | Paper 160V |
| C29 | 0.1 µF | 0.1 µF | 0.1 µF | 0.1 µF | 0.1 µF | 0.1 µF | 0.1 µF | Paper 600V |
| C47 | - | - | - | - | - | 500pF | 500pF | Mica 750V |

### VALVES.

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| V1 | GZ34 | GZ34 | GZ34 | GZ34 | GZ34 | GZ34 | GZ34 | Mullard. |
| V2 | - | 6BW6 | 6BW6 | - | - | - | - | Mullard. |
| V3 | GTR150W | GTR150W | GTR150W | GTR150W | GTR150W | GTR150W | GTR150W | Hivac. |
| V4 | GTR150W | GTR150W | GTR150W | GTR150W | GTR150W | GTR150W | GTR150W | Hivac. |
| V5 | 108C1 | 108C1 | 108C1 | 108C1 | 108C1 | 108C1 | 108C1 | Mullard. |
| V6 | 108C1 | 108C1 | 108C1 | 108C1 | 108C1 | 108C1 | 108C1 | Mullard. |
| V7 | EL34 | EL34 | EL34 | EL34 | EL34 | EL34 | EL34 | Mullard. |
| V8 | EL34 | EL34 | EL34 | EL34 | EL34 | EL34 | EL34 | Mullard. |
| V9 | EL34 | EL34 | EL34 | EL34 | EL34 | EL34 | EL34 | Mullard. |
| V10 | EF91 | EF91 | EF91 | EF91 | EF91 | EF91 | EF91 | Mullard. |
| V11 | EF91 | EF91 | EF91 | EF91 | EF91 | EF91 | EF91 | Mullard. |
| V12 | - | 1B3GT | 1B3GT | - | - | - | - | R.C.A. |
| V13 | - | 1B3GT | 1B3GT | - | - | - | - | R.C.A. |

### RELAYS.

| | |
|---|---|
| RLA | 2 c/o Coil resistance. 25 Ω |
| RLB | 4 c/o Coil resistance. 29 Ω |
| RLC | 1 contact n/o. Coil resistance 200 Ω |

### TRANSFORMERS.

| | |
|---|---|
| T1 | Mains transformer Type St. 1008/B. |
| T2 | E.H.T. transformer Type / Model No. |

### FUSE LINKS.

| | |
|---|---|
| F1 | 1 amp. |
| F2 | 250 mA Mag. Nickel. |

### SILICON RECTIFIERS.

| | | |
|---|---|---|
| D1 | S.T.C. | RAS 310AF. |
| D2 | S.T.C. | RAS 310AF. |
| D3 | S.T.C. | RAS 310AF. |

## ELECTRICAL INFORMATION (CONT'D)

| | | |
|---|---|---|
| JACKS. | J1 | Jack Plug Bulgin P215. |
| R.F. CHOKE. | RFH/CH1 | Type Eddystone Radio 1010 1.5 mH. |

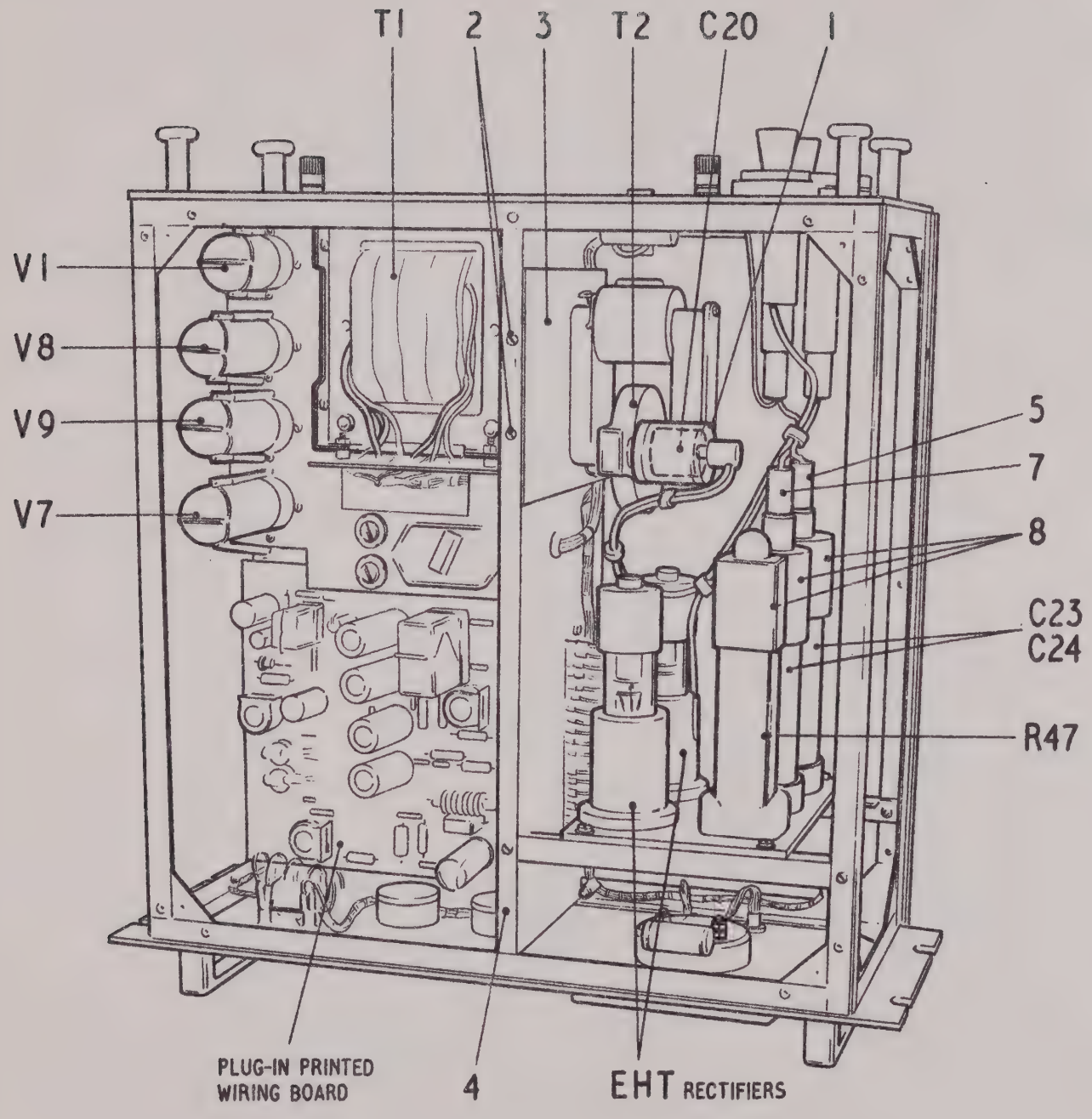

T1
2
3
T2
C20
1
V1
V8
V9
V7
5
7
8
C23
C24
R47
PLUG-IN PRINTED WIRING BOARD
4
EHT RECTIFIERS

FIG. 1

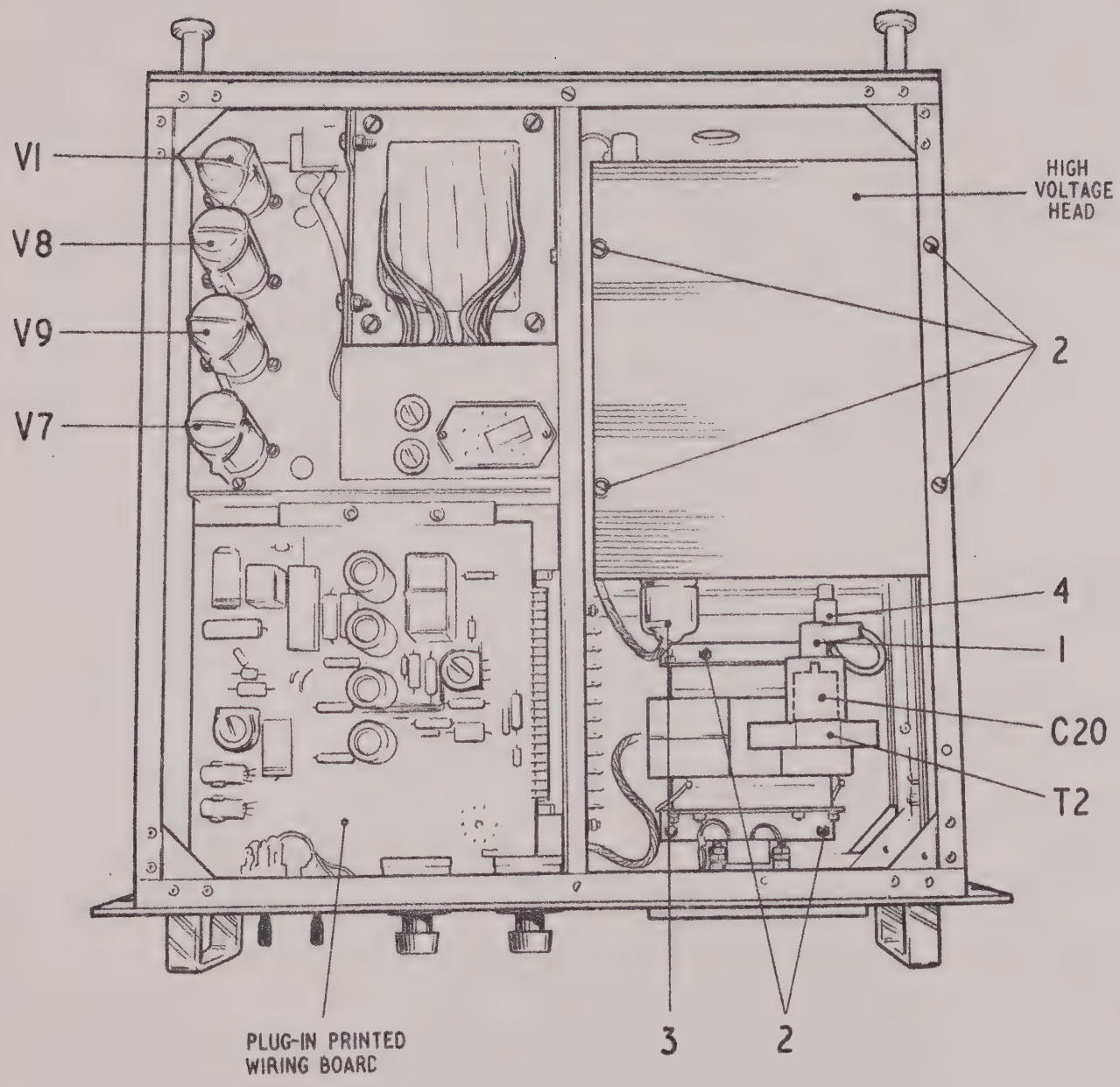

V1
V8
V9
V7
HIGH VOLTAGE HEAD
2
4
1
C20
T2
PLUG-IN PRINTED WIRING BOARD
3
2

FIG. 2

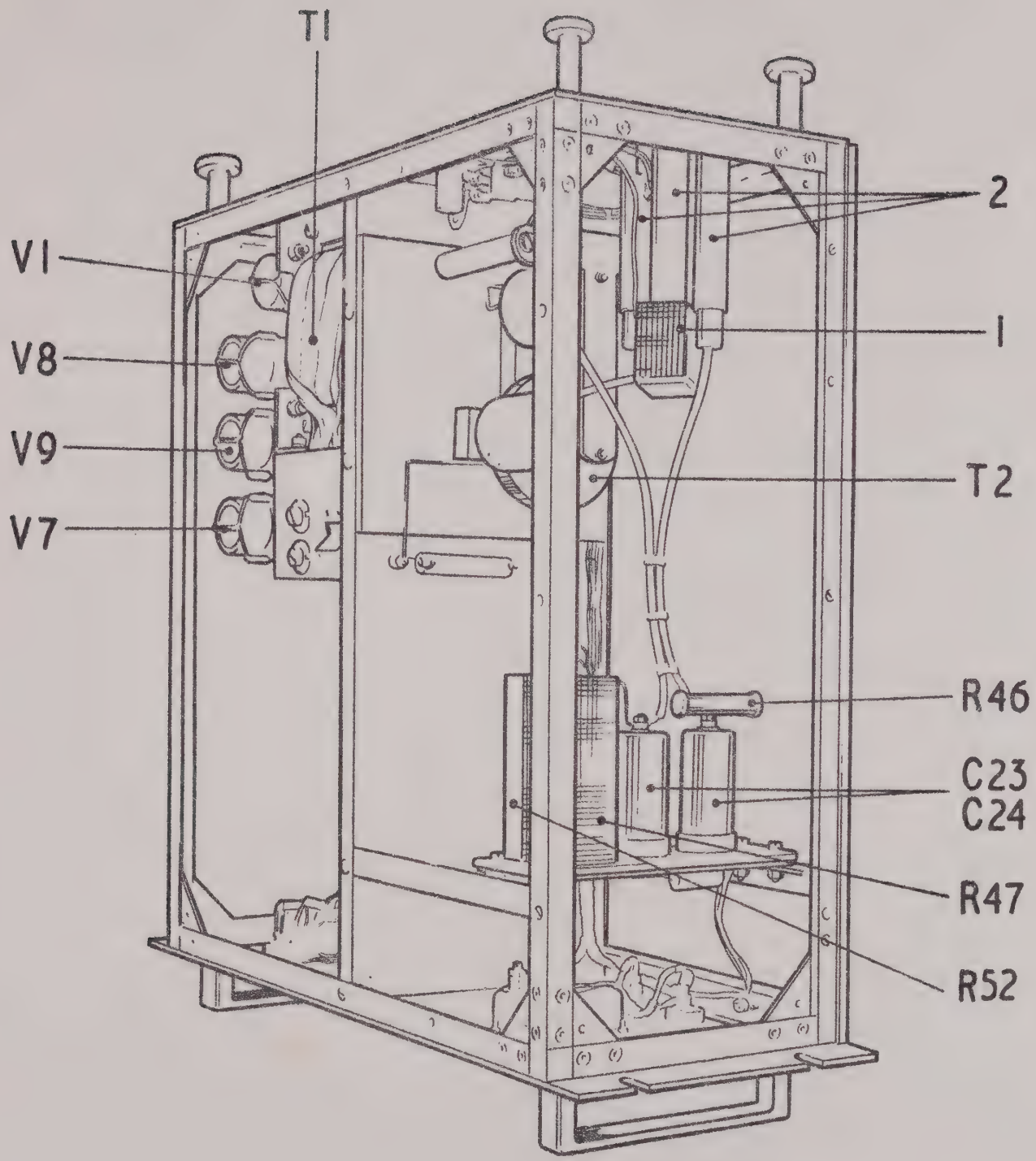
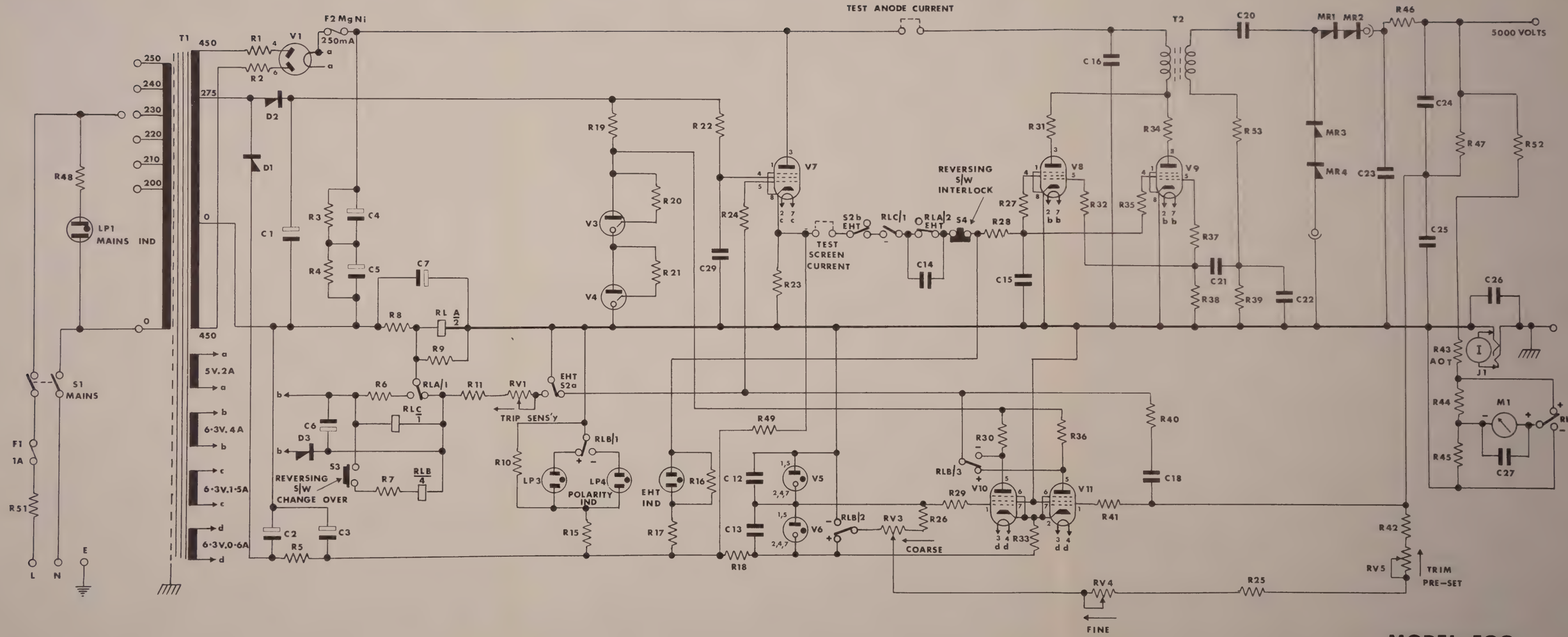
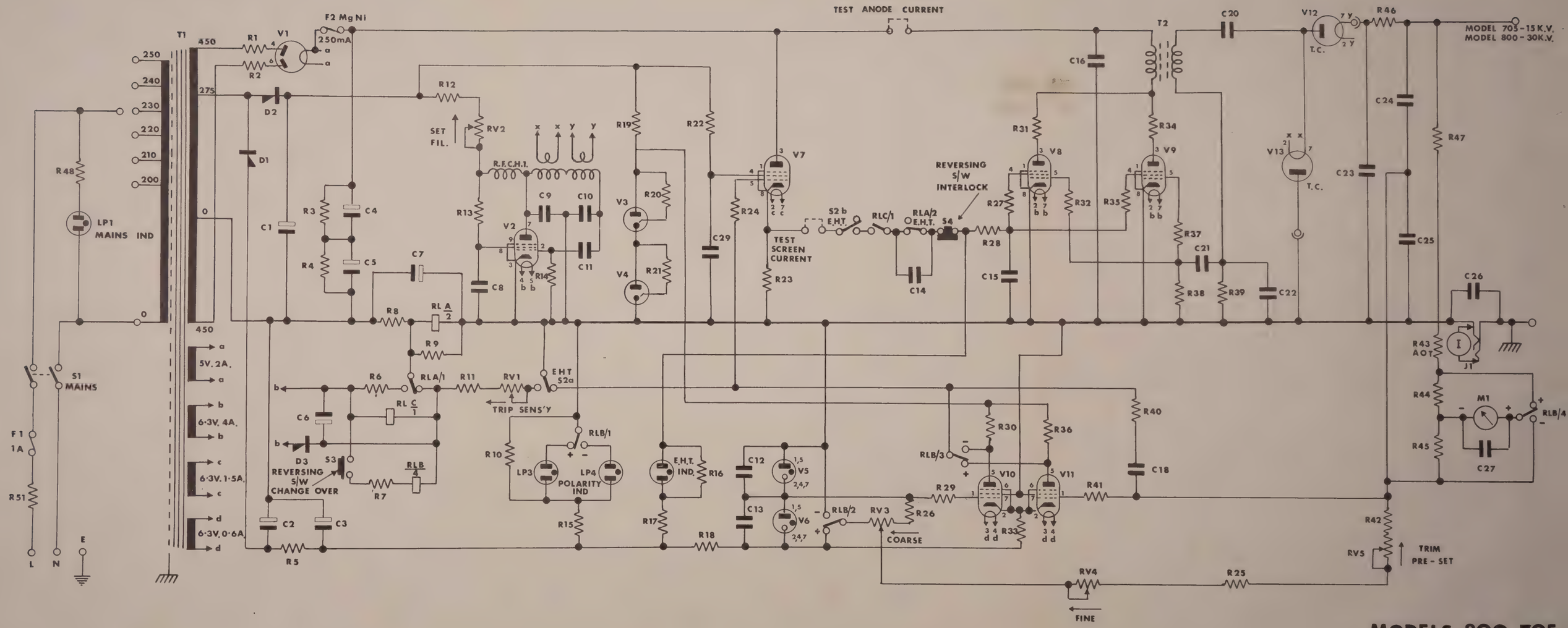


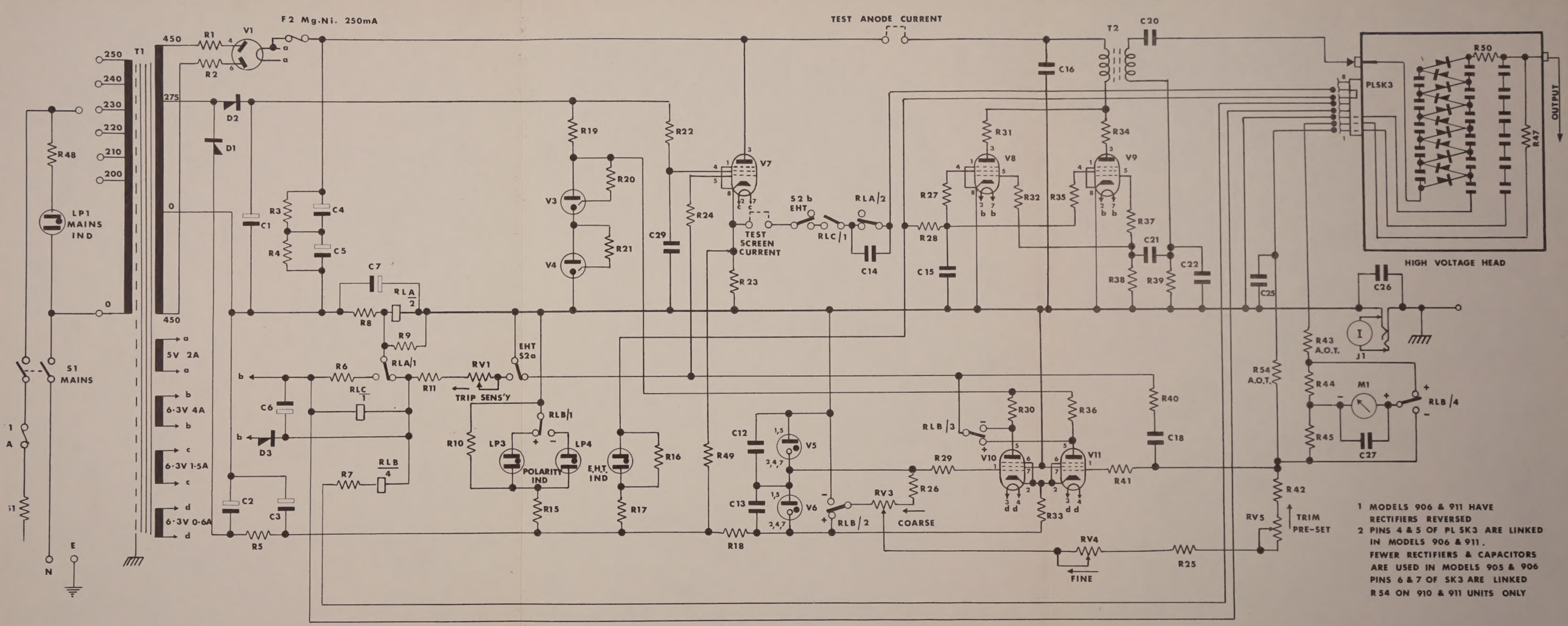

FIG. 3


TEST ANODE CURRENT
T1
T2
F2 Mg Ni
250mA
V1
R1
R2
D1
D2
C1
R3
R4
C4
C5
C7
R8
RL A/2
R9
250
240
230
220
210
200
0
450
275
R48
LP1
MAINS IND
S1
MAINS
F1
1A
R51
L
N
E
5V. 2A
6·3V. 4A
6·3V. 1·5A
6·3V. 0·6A
R6
RLA/1
RLC/1
R11
RV1
TRIP SENS'y
EHT S2a
C6
D3
S3
REVERSING S/W CHANGE OVER
R7
RLB/4
C2
C3
R5
R10
LP3
LP4
POLARITY IND
RLB/1
R15
R19
R20
V3
V4
R21
R22
R24
C29
V7
R23
TEST SCREEN CURRENT
S2b EHT
RLA/2 EHT
S4
REVERSING S/W INTERLOCK
C14
C15
R28
R27
R31
V8
R32
R35
R34
V9
R37
C21
R38
R39
C22
R53
C16
C20
MR1
MR2
R46
5000 VOLTS
MR3
MR4
C23
C24
C25
R47
R52
C26
R43 AOT
J1
I
R44
M1
R45
C27
RLB/4
R40
C18
R30
R36
RLB/3
V10
V11
R29
R41
R26
RV3
COARSE
RLB/2
R49
C12
C13
V5
V6
R16
EHT IND
R17
R18
R33
R42
RV5
TRIM PRE-SET
RV4
FINE
R25

**MODEL 500**




**MODELS 800, 705**




1 MODELS 906 & 911 HAVE RECTIFIERS REVERSED
2 PINS 4 & 5 OF PL SK3 ARE LINKED IN MODELS 906 & 911.
FEWER RECTIFIERS & CAPACITORS ARE USED IN MODELS 905 & 906
PINS 6 & 7 OF SK3 ARE LINKED
R 54 ON 910 & 911 UNITS ONLY

# MODELS 905,906,910,911

MP MASTER
MA23508